



SUBJECT Exhibit Submission Guidelines
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ISSUED BY Alexander Visotin, Laboratory Manager

Introduction

Different types of exhibits recovered from a fire scene must be packaged appropriately to ensure they are preserved properly for analysis. Improperly packaged samples may produce incorrect chemical analysis results or may render an examination of electrical items impossible. This, in turn, can complicate the origin and cause investigation. This Technical Bulletin aims to provide guidance for the packaging and sealing of items that are to undergo laboratory testing. This includes items undergoing gas or electrical examination, metallurgical examination, and chemical analysis.

Exhibits received by GKA Analytical Services that are not packaged and sealed in line with these guidelines might not be accepted for analysis as our laboratory processes are aligned with the strict chain of custody requirements of ISO/IEC 17025. If you are unsure of any of these requirements, please contact our office for confirmation before sending exhibits to our laboratory.

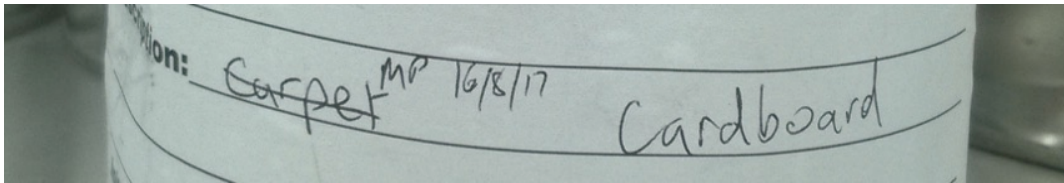
General guidelines for ALL items submitted to the laboratory

All exhibits must have complete and legible exhibit labels attached to them. This label must contain enough information to identify the exhibit. Affix exhibit labels to the exterior of the exhibit or exhibit container in a visible location. If the exhibit label cannot easily be attached to the exhibit container surface, it may be attached directly to the exhibit using a piece of string or similar device.

At minimum, the exhibit label must contain:

- Time and date of collection;
- Location of collection (including room or general area of the premises);
- Description of the exhibit or material;
- Collector's signature;
- Exhibit number;
- Case number.

If a mistake is made when filling out an exhibit label, the mistake must be eliminated (crossed out) with a single horizontal line through the unwanted text. It is important that the unwanted text is still legible after it has been crossed out. Eliminations must be initialled and dated. Continue writing on the label as normal after the elimination.



Example of a properly corrected exhibit label with date and initials.

If the exhibit is packaged in a container, wipe down the container after it has been sealed.

If exhibits are collected from a scene containing friable asbestos, include text on the exhibit label specifying that asbestos may be present (e.g. "ASBESTOS", "CONTAINS ACM").

Packaging guidelines for general exhibits (gas appliances, electrical appliances, etc.)

Exhibits must be packaged in such a way as to protect them from damage during transport and the environment. Small items may be packaged into cardboard boxes, tins, or bags. Larger items such as whitegoods can be packaged using garbage bags, plastic wrap, or tarpaulin, and secured with tape or rope.

Secure any loose parts inside the largest piece of the exhibit, or package them as separate exhibits.

Ensure that the packaging is robust enough to withstand environmental effects such as rain and wind, and that it will reasonably contain the exhibit. Exhibits with sharp edges should be packaged in a container that will withstand puncture. Alternatively, the sharp edges can be protected with material such as foam.

Packaging must be sealed such that items will not be able to enter or exit the packaging during transport.

Packaging guidelines for fire debris samples

Wear sterile examination gloves when collecting and packaging fire debris samples. Dispose of each pair of gloves after collecting each sample. Do not place used gloves inside the evidence container with the fire debris. If using a consumable/disposable item to collect samples such as a disposable pipette, dispose of the item after collecting each sample. Do not place anything inside the container except for the debris to be tested.

Fire debris analysis relies on the detection of volatile organic compounds that are trapped within the sample substrate. If not properly packaged, the chemical composition of the sample can be altered, resulting in false negative results (from loss of the sample) or false positive results (from contamination).

Containers must be **airtight and impermeable to gases**. Containers used for fire debris must also be free of hydrocarbon contaminants, as determined by our laboratory. To assess whether your container is appropriate, submit a clean and unused container to our laboratory for testing. A list of recommended containers and collection media is presented on the following pages. If you would like to purchase any of the below sampling materials, please contact our office.

Do not submit leaking or wet sample containers. If you can smell a petroleum product when the container is brought to your nose, the container is either improperly sealed, the exterior of the container is contaminated, or the container may be inappropriate for the debris.

A length of tamper-proof security tape must be placed across the container seal. The tape must be placed in such a way that opening the container would disrupt the tape. For metal tins, tape may

be run across the top and down the sides of the tin. For bags, place a strip of tape across the knot or seal. The tape must be signed and dated by the sample collector.



Example of a signed security tape seal.

Collection methodology for fire debris samples

Debris in the form of small items and fragments must be collected in airtight containers such as metal paint tins. We recommend submission of fire debris samples in metal tins wherever possible. Canning (mason) jars can also be used. Food packaging companies, industrial container manufacturers, and forensic suppliers can supply these items. Whichever container is used, the lid seal must be strong and secure.

Cardboard boxes and plastic food storage containers should never be used for fire debris.



Appropriate fire debris packaging: metal tins and properly sealed fire debris bags.



Inappropriate fire debris packaging: cardboard boxes and regular plastic shopping bags.

Collect the debris by sweeping, shovelling or scraping the debris into the sample container and sealing the lid.

Fill the container approximately three-quarters full. *Do not overfill the container.* If the container is too full, it may require separation into two separate samples, resulting in another analysis fee. If the debris smells strongly of a petroleum product, only a very small sample of it is required.



Do not overfill sample containers; this tin is too full.

If the container has a friction lid, seal the lid with a mallet or similar device to ensure the lid is sealed as tightly as possible. Screw-top lids must be screwed tightly shut.

Items of debris that do not fit into rigid containers can be packaged in polymer fire debris sample bags. Special fire debris bags manufactured from polyester or nylon can be purchased from forensic suppliers for this purpose. We recommend bags manufactured by Ampac (USA), which are specifically designed for fire debris analysis. Food packaging suppliers may also carry suitable bags. Polymer fire debris bags must be free of hydrocarbon contaminants, as determined by our laboratory. To assess whether your bag is appropriate, submit a clean and unused bag to our laboratory for testing.

Regular plastic shopping bags and Ziplock bags should never be used for fire debris. Bags manufactured from polyethylene, polystyrene, and polypropylene should never be used.

The bag must be secured in such a way as to prevent volatile compounds from escaping. The best method of sealing in this regard is heat-sealing. We recommend submission of polymer fire debris bags with heat seals wherever possible.

If a heat sealer cannot be used, bags should be twisted tightly closed. After twisting as many times as possible, the twist should be folded over or knotted. Tape should then be applied over the fold or knot to trap any volatiles that may make their way through the obstruction. Finally, cable ties or rope should be installed over the knot or fold to secure it in place even further. The cable ties or rope should be tightened as much as physically possible. The more secure the bag seal can be made, the better.



Well-sealed plastic bag: twisted shut, gooseneck tie, cable ties, and tape.

If even larger samples are required for fire debris testing that do not fit into fire debris bags, it is advisable to subdivide the item into multiple smaller samples and package these individually. Our laboratory will not accept samples submitted without appropriate packaging.

Collection of liquids

If the liquid is in a pool, a small volume of the liquid can be subsampled and collected. These liquids can be decanted directly into glass sample vials or aspirated via pipette. Vials and pipettes may be purchased from laboratory equipment suppliers.

When sampling neat liquids, only a small amount is required for basic ignitable liquid identification (less than 1 mL). Secure the cap to the vial tightly after sampling. Vials must be submitted with exhibit labels containing all of the necessary sample information as indicated on page 1.



Different types of glass sample vials.

Collection of dry residues and stains

If the liquid has partially dried or is only present in small amounts, it can be collected by absorption. We recommend the use of *Pig® Oil-Only Absorbent Mat Pads* to absorb these residues, as studies have shown these pads to be the most appropriate for fire debris sampling. They are available from New Pig (USA, product no. MAT423), or Australian distributors. The pads must be kept in a sealed tin or other airtight package at all times when not in use. If you would like to purchase absorbent mat sampling kits, please contact our office.



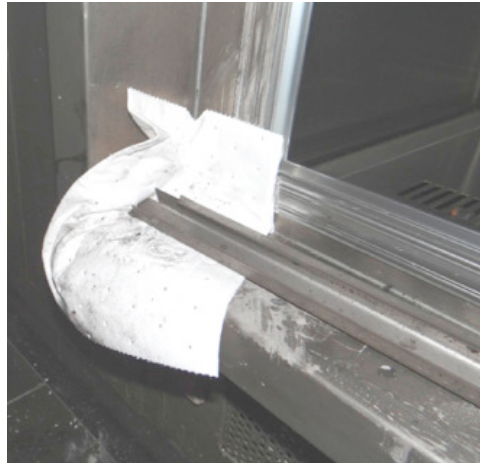
Pig Oil-Only Absorbent Mat Padding.

Alternatively, any inert, contaminant-free absorbent material may be used for sampling. To assess whether your sampling media is appropriate, submit a sample to our laboratory for testing.

To collect the sample, dab the absorbent material around the sampling area. If the residue is difficult to remove, use a wiping motion. Apply pressure if necessary. Rub the material onto the hard surface to remove small amounts of residue trapped in the substrate. Leave the pad on the sampling area until it has soaked up as much of the stain as possible.

If using the recommended Oil-Only Absorbent Mat Pads, you may use a small amount of water to mobilise the residue before applying the pad. Note that this technique will not be effective unless using the recommended absorbent pads. In all other cases, water should never be used to collect samples for fire debris analysis.

After sampling, place the absorbent into a regular sample container and label as a normal sample.



Application of an absorbent pad during sampling (Burda *et al.*, 2016).

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